CLAIMS

1. An optical element having wavelength selectivity, characterized by:

a lens array having one end face and a plurality of lenses (L1-L8) arranged on the one end face; and

a multi-layered film filter (13) which is formed on the one end face (14) of the lens array and includes high refractive-index dielectric layers and low refractive-index dielectric layers laminated alternately and whose film thickness continuously changes in accordance with positions of the individual lenses.

2. The optical element according to Claim 1, characterized in that the plurality of lenses are aligned in a line toward a second end from a first end of the one end face of the lens array and the film thickness of the multi-layered film filter linearly changes toward the second end from the first end.

3. The optical element according to Claim 1 or 2, characterized in that the lens array is a rod lens array including a plurality of rod lenses.

4. The optical element according to Claim 1 or 2, characterized in that the lens array is a gradient index planar microlens (50, 60) including a single substrate (59, 69) and a plurality of microlenses (51-56, 61-66) formed in a line on the substrate.

5. The optical element according to Claim 4, characterized in that the plurality of microlenses (61-66) protrude from the substrate.

6. The optical element according to any one of Claims 1 to 5, characterized in that the lens array has an other end face (24) facing the one end face; and

the optical element further has a light emitting device (30) formed on the other end face for emitting light toward the multi-layered film filter via individual lenses of the lens array.

7. The optical element according to Claim 6, characterized in that the light emitting device is integral with the lens array.

8. The optical element according to Claim 6 or 7, characterized in that the light emitting device includes a plurality of light sources (LD1-LD8) provided in association with individual lenses of the lens array.

9. The optical element according to any one of Claims 1 to 5, characterized in that the lens array has an other end face facing the one end face; and

the optical element further has a plurality of light receiving elements (PD1-PD8) formed on the other end face for respectively receiving a plurality of optical signals having different center wavelengths, obtained by demultiplexing input light by the multi-layered film filter, via individual lenses of the lens array.

10. The optical element according to Claim 9, characterized in that the plurality of light receiving elements are integral with the lens array.

11. A method of manufacturing an optical element

having wavelength selectivity, characterized by:

a step of preparing a lens array (12) having one end face and a plurality of lenses (L1-L8) arranged on the one end face; and

a step of directly forming a multi-layered film filter on the one end face of the lens array by a physical vapor deposition method in such a way that the film thickness continuously changes in accordance with positions of the plurality of individual lenses.

12. The optical element manufacturing method according to Claim 11, further characterized by:

a step of arranging the lens array in such a way that the one end face of the lens array is inclined with respect to an evaporation source or a target, prior to the step of forming the multi-layered film filter.

13. The optical element manufacturing method according to Claim 12, further characterized by:

a step of arranging a film thickness correcting plate (70) having a substantially trapezoidal opening portion (71) between the lens array and the evaporation source or target, prior to the step of forming the multi-layered film filter.